



77368

US005746018A

United States Patent [19][11] **Patent Number:** **5,746,018****Kirschner et al.**[45] **Date of Patent:** **May 5, 1998**[54] **MUZZLE BRAKE FOR AN UNDERWATER GUN****FOREIGN PATENT DOCUMENTS**

72592 2/1983 European Pat. Off. 89/14.4

[75] **Inventors:** **Ivan N. Kirschner**, Portsmouth; **Gary R. Berlam**, Warwick, both of R.I.**Primary Examiner**—Stephen M. Johnson
Attorney, Agent, or Firm—Michael J. McGowan; Prithvi C. Lall; James M. Kasischke[73] **Assignee:** **The United States of America as represented by the Secretary of the Navy**, Washington, D.C.[57] **ABSTRACT**[21] **Appl. No.:** **882,001**[22] **Filed:** **May 19, 1997**[51] **Int. Cl.⁶** **F41A 21/30**[52] **U.S. Cl.** **42/1.14; 89/14.4**[58] **Field of Search** **42/1.14, 79; 89/14.4; 181/223, 280**[56] **References Cited****U.S. PATENT DOCUMENTS**

1,525,846	2/1925	Wurtzebach	181/223
3,300,888	1/1967	Belcher et al.	42/1.14
3,677,132	7/1972	Plenge	42/1.14
4,939,977	7/1990	Stroup	89/14.4
5,648,631	7/1997	Kirschner et al.	89/1.14
5,687,501	11/1997	Stace et al.	42/1.14

A device for use as a muzzle brake for an underwater gun having a projectile conveying structure with concentric inner and outer cylinders. The inner cylinder has at least one longitudinal slot formed therein. A sealing means joins the projectile conveying structure to the underwater gun at the structure's first end. A second end of the structure is provided with a seal for closing the second end after a projectile is fired through it. A piston having an aperture therethrough is positioned inside the inner cylinder and is axially moveable therein adjacent the longitudinal slot. An actuator is positioned between the inner cylinder and the outer cylinder. Actuator links through the longitudinal slot connect the piston with the actuator. After a projectile is fired through the projectile conveying structure to displace the piston from its initial position, the actuator means returns the piston to that initial position to ready the device for reuse.

13 Claims, 1 Drawing Sheet